AEROSOL VALVE WITH FILLING MEANS

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ABSTRACT

A valve for an aerosol container including a valve body having a number of fill orifices through which propellant and product may be more easily and more rapidly pressure filled. The fill orifices are arranged on the valve body in spaced relation to the customary dispensing on the valve body. Locking means may be fixedly or detachably mounted on the valve body in a predetermined spaced relation to the fill orifices in order to secure the customary dip tube thereto.

1 Claim, 5 Drawing Figures
AEROSOL VALVE WITH FILLING MEANS

This invention is generally concerned with a valve body for an aerosol container which includes a plurality of orifices designed specifically for the filling of the aerosol container and locking means to secure the customary dip tube to the valve body to prevent disengagement of said tube during such filling.

Conventional aerosol dispensers generally comprise a pressurized container having a valve secured to the upper end thereof to control both the filling and discharge of the product. After the container has been filled and when not in use, the valve is biased to seal both the product and the propellant within the container. A dip tube is normally attached to the valve body to extend downwardly to a point adjacent to the container bottom.

In aerosol dispensers of this type, the container is generally filled with propellant or even product and propellant after the valve body is mounted thereon. By such action, the valve is forced to its unsealed, discharge position and the propellant and/or product is forced to flow under pressure through the valve and into the container through the customary dispensing orifice, which serves as an expansion orifice, located on the valve body, and then through the dip tube.

Filling of aerosol dispensers in this manner is generally considered to be time consuming and otherwise inefficient primarily due to the relatively small size of the dispensing orifice. The size of this orifice, while necessary for the proper discharge of product, unfortunately limits the rate of flow of product into the container during the filling operation. Accordingly, filling of the container, even under increased pressure, is time consuming and costly. Another disadvantage prevalent with dispenser of this type is the disengagement of the dip tube from the valve body during the filling operation. This disadvantage is heightened when the product enters the tube in a direction other than along its longitudinal axis. Disengagement of the dip tube from the valve body, of course, renders the filled dispenser useless.

It is therefore an object of this invention to provide an aerosol dispenser capable of having its container filled with the desired amount of product and propellant under pressure in a rapid and more efficient manner.

Another object is to provide an aerosol dispenser which may be rapidly filled under pressure without disengagement of the dip tube from the valve body.

A further object is to provide an aerosol dispenser wherein the product and propellant can enter the container under pressure other than through the dispensing orifice.

A still further object is to provide an aerosol dispenser wherein the container may be filled under pressure through a plurality of fill orifices arranged on the valve body in spaced relation to the dispensing orifice.

Another object is to provide a valve body having locking means arranged in predetermined relation to the fill orifices and serving to secure a dip tube to the valve body during pressurized filling of the container.

Another object is to provide a valve body for an aerosol dispenser having locking means detachably mounted thereon so as to secure a dip tube to the valve body during rapid, pressurized filling of the container.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The above and other objects not specifically enumerated are efficiently obtained by providing a container with a unique valve body which includes a number of fill orifices designed to rapidly and efficiently fill the container portion of the aerosol dispenser.

This invention involves a valve body comprising a head portion and a depending tail portion of somewhat decreased diameter. At least one and preferably a number of fill orifices are formed in the tail portion in intercommunicating relation between the interior of the valve body and the interior of the container. The fill orifices are arranged in spaced relation to a dispensing orifice through which the product is discharged from the container.

Locking means such as one or more anchoring rings, or a compression ring, or a frictional fit between the tail portion and an outer skirt, or combination thereof, are integrally or detachably mounted on the valve body to secure the dip tube to the tail portion. These locking means are positioned with respect to the fill orifices to ensure that the dip tube remains attached to the valve body. The exact location of the fill orifices with respect to the locking means determines whether the product and propellant are directed into the container through the lower extremity or through the upper extremity of the dip tube for during pressurized filling, a part of the dip tube moves away from the fill orifices by the force of the expanding incoming product and propellant.

In use the valve with the dip tube secured thereto, is inserted into the open-mouth container which may or may not already have product therein. The valve is then sealed thereon generally by crimping. Propellant or a propellant-product mixture is then forced into the container through the valve body. It passes from the interior of the valve body, through the fill orifices, temporarily expanding the dip tube adjacent the fill orifices, into the dip tube and then into the container body. The aerosol dispenser is now ready for discharge of product.

Upon discharge, the product flows through the discharge orifice and cut through the valve stem in the conventional manner. The pressure exerted by the propellant, causing discharge of the product, is insufficient, within the valve body, to cause expansion of the dip tube, thereby preventing engagement with the fill orifices. Accordingly, the flow of product is in usual manner, i.e., through the dispensing orifice in the valve body so that proper expanding, prior to final exit, occurs.

The invention accordingly comprises an article of manufacture possessing the features, properties, and the relation of elements which will be exemplified in the article hereinafter described, and the scope of the invention will be indicated in the claims. For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is a sectional view of an aerosol dispenser including a valve body secured to a dip tube and having fill orifices formed therein.

FIG. 2 is a sectional view of the valve body having the fill orifices located near the upper extremity of the dip tube.

FIG. 3 is a sectional view of the valve body having a depending skirt attachment.

FIG. 4 is a sectional view of the valve body having detachable locking means.

FIG. 5 is a sectional view of the valve body having the fill orifices angularly oriented relative to the valve body.

Similar reference characters refer to similar parts throughout the several views of the drawings.

FIG. 1 illustrates a typical aerosol dispenser upon which the invention may be used. The dispenser comprises container 10 having a closed bottom 12. A mounting cup 14 is sealed to the container and has a valve, generally indicated as 16, attached thereto. Valve 16 is secured within the central turret portion of mounting cup 14 and includes a valve body 18. The valve further includes a seal ring 20, a tubular valve stem 22 extending through ring 20 and a valve sealer 24. The sealer 24 is forced into sealing engagement with ring 20 by valve spring 26. The valve body 18 further comprises a head portion 28 and a depending tail portion 30 having a somewhat smaller diameter than head portion 28. A dispensing orifice 32 is arranged in the bottom of tail portion 30. Dip tube 34 is secured to the tail portion 30 by an anchoring ring 36. A plurality of fill orifices 38 are formed in the lateral wall of tail portion 30. Each of the fill orifices is arranged in spaced relation to dispensing orifice 32 and is sealed by dip tube 34 when inoperative. As clearly shown in FIG. 1, when propellant or product is pressurizing the fill surface 42 of dip tube 34 is forced away from sealing engagement with fill orifice 38. Anchoring ring 36 prevents "blow-off" of the dip tube 34. After the pressure fill operation, surface 42 resumes sealing engagement with fill orifices 38 and during discharge the pres-
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sure within valve body 18 is insufficient to overcome the natural bias of the tube and the pressure on the tube exterior. Hence, the fill orifices stay covered and sealed.

An additional aperture or vapor tap 44 is formed in the head portion 28. The vapor tap serves to vent some gaseous propellant which normally accumulates in the top interior of container 10 into product being discharged. This provides better spray patterns.

FIG. 2 shows the fill orifices 38 arranged between the upper extremity 48 of dip tube 34 and anchoring ring 36. During filling operation, the product enters the interior of tail portion 30 and forces the surface 42 of the upper extremity 48 of dip tube 34 outwardly. This in turn allows the passage of the product and propellant to pass through the fill orifices and over extremity 48 in the manner shown.

The embodiment shown in FIG. 3 involves a valve body 18 having an annular depending skirt 50. Skirt 50 is preferably integrally formed with head 28 and is somewhat resilient. The annular space 52 between the skirt and tail portion 30 is sufficient to accommodate the upper extremity 48 of dip tube 34 with sufficient friction to "lock" the dip tube to the tail. Alternatively, one or more anchoring rings 36 may be formed on either or both (as shown) the inner surface 52 of skirt 50 or the outer surface of tail portion 30 which is surrounded by skirt 50.

FIG. 4 shows an alternate embodiment of skirted valve body 18. Here the locking means comprises a detachable ring 54 mounted on the outer surface 56 of skirt 50. Ring 54 is designed to compress skirt 50 about tail 30 in such a manner as to decrease the space 52 thereby grasping extremity 48 of dip tube 34. The resiliency of skirt 50 may be increased by providing a slot 58.

FIG. 5 shows a variation in the shape of the fill orifices 38. Here they are arranged such that their axis are generally angularly inclined to the longitudinal axis of valve body 18. This structure minimizes "fluttering" of dip tube 34 during the pressurized filling of container 10 whereby the locking means employed will remain secure. Accordingly, propellant and product may be filled at an even greater pressure whereby increasing the speed and efficiency of filling a container.

In the assembly and mounting of valve 16 in an aerosol container, no variation in standard technique is involved. The valve, after assembly, in standard fashion, is simply mounted in turret 14 and the turret is cramped to seal the valve in the open end of container 10. During the filling operation, container 10 is filled by any appropriate filling mechanism capable of cooperating with valve 16. In such action, sealer 24 is forced down such that propellant and/or product may be forced into the interior of valve body 18. It enters the container primarily through fill orifices 38. In actual practice, a certain amount also flows into container 10 through discharge orifice 32. However, due to the generally increased diameter of fill orifices 38 and their spaced location relative to dispensing orifice 32, the majority of mixture will force surface 42 of the dip tube 34 away from sealing engagement with fill orifice 38. The product mixture thereby passes through the fill orifice 38, through dip tube 34 and into the interior of container 10.

While only two embodiments of fill orifice 38 have been shown (FIGS. 1 and 5), obviously other shapes to improve filling can be utilized. For example, the lower end of the dip tube may be vertically slotted with a fill orifice at the top of each slot. Similar variation may be made in the sealing means employed. For example, a split ring or an elastic band could be used on the lower extremity of the valve body rather than on the skirt.

It will thus be seen that the objects set forth above among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above article without departing from the scope of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Now that the invention has been described, what is claimed is:

1. A valve for an aerosol dispenser comprising: a valve body, at least one dispensing orifice formed in said valve body, said valve body including locking means for securing a dip tube to said valve body; at least one fill orifice formed on said valve body substantially larger than said dispensing orifice and normally sealed by said dip tube and said fill orifice arranged in spaced relation to said dispensing orifice, said locking means located on said valve body between said fill orifice and said dispensing orifice whereby said dispenser is primarily filled through said fill orifice during pressure filling by expansion of said dip tube in the area immediately adjacent said fill orifice.

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